

WHAT IS CLAIMED IS:

1. A process for rejuvenating a diffusion aluminide coating on a component following deposition of the diffusion aluminide coating and before placing the component in service at an elevated temperature, the diffusion aluminide coating comprising an additive layer on a surface of the component and a diffusion zone below the additive layer and in a surface region of the component, the process comprising the steps of:

treating the diffusion aluminide coating to an aqueous solution consisting essentially of nitric acid and phosphoric acid at a temperature of about 70°C to about 80°C until at least part of the additive layer has been removed but the diffusion zone remains, thereby establishing a treated surface of the diffusion aluminide coating; and then  
aluminizing the treated surface of the component.

2. A process according to claim 1, wherein the aqueous solution consists of nitric acid, phosphoric acid and water.

3. A process according to claim 1, wherein the aqueous solution contains nitric acid and phosphoric acid in substantially equal proportions.

4. A process according to claim 1, wherein the diffusion aluminide coating is treated for a duration of about 20 to about 30 minutes.

5. A process according to claim 1, wherein the aqueous solution is at a temperature of about 75°C and the diffusion aluminide coating is treated for a duration of about 25 minutes.

6. A process according to claim 1, further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

7. A process according to claim 1, wherein the diffusion aluminide coating contains platinum, the process further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

8. A process according to claim 1, wherein the diffusion aluminide coating is present on the component as a result of aluminizing the component after the component has been placed in service at an elevated temperature.

9. A process according to claim 8, wherein the diffusion aluminide coating is present on the component at a thickness in excess of 100 micrometers prior to the treating step.

10. A process according to claim 1, wherein the component is a gas turbine engine component, and the diffusion aluminide coating is present on the component as a result of aluminizing the component after the component was installed on a gas turbine engine, the gas turbine engine was operated, and the component was removed from the gas turbine engine.

11. A process according to claim 10, wherein the diffusion aluminide coating is present on the component at a thickness in excess of 100 micrometers after the aluminizing step and prior to the treating step.

12. A process according to claim 1, wherein the treating step removes substantially all of the additive layer and does not damage the surface region of the component.

13. A process for rejuvenating a diffusion aluminide coating on a gas turbine engine component, the diffusion aluminide coating comprising an additive layer on a surface of the component and a diffusion zone below the additive layer and in a surface region of the component, the process comprising the steps of:

removing the component from a gas turbine engine after the gas turbine engine was operated;

aluminizing the component to form a rejuvenated diffusion aluminide coating having an additive layer with a thickness in excess of 100 micrometers;

before placing the component in service on a gas turbine engine, treating the diffusion aluminide coating to an aqueous solution consisting essentially of nitric acid and phosphoric acid at a temperature of about 70°C to about 80°C for a duration of about 20 to about 30 minutes to remove at least part of the additive layer but the diffusion zone remains, thereby establishing a treated surface of the diffusion aluminide coating on the component; and then

aluminizing the treated surface of the component to form a second rejuvenated diffusion aluminide coating having an additive layer with a thickness of not greater than 100 micrometers.

14. A process according to claim 13, wherein the aqueous solution consists of nitric acid, phosphoric acid and water.

15. A process according to claim 13, wherein the aqueous solution contains nitric acid and phosphoric acid in substantially equal proportions.

16. A process according to claim 13, wherein the aqueous solution is at a temperature of about 75°C and the diffusion aluminide coating is treated for a duration of about 25 minutes.

17. A process according to claim 13, further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

18. A process according to claim 13, wherein the diffusion aluminide coating contains platinum, the process further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

19. A process according to claim 13, wherein the treating step removes substantially all of the additive layer and does not damage the surface region of the component.

20. A process according to claim 13, wherein the step of aluminizing the treated surface is a vapor phase aluminiding process.